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=> d his

     (FILE 'HOME' ENTERED AT 11:38:55 ON 14 AUG 2002)
     FILE 'CA' ENTERED AT 11:39:11 ON 14 AUG 2002
          E COMIZZOLI R/AU
L1      66 S E4-6
L2       1 S L1 AND 1991/PY
          E LEWERENZ H/AU
L3     239 S E4-10
L4       8 S L3 AND ELECTROCHIM?/SO
L5       1 S L4 AND 1992/PY
L6      31 S TRIPLE TRACK
L7    9572 S (SI OR SILICON OR POLYSI OR POLYSILICON)(2A)(WIRE OR CONDUCTOR OR
          ELECTRODE)
L8      61 S L7 AND(MEMS OR MICROELECTRON? OR INTEGRATED OR IC OR CIRCUIT)(6A)
          (FAILURE OR RELIAB? OR PROTECT?)
L9      94 S L2,L5-6,L8
L10     90 S L9 NOT PY>2000

=> d l14 bib,ab 1-90

L14  ANSWER 21 OF 90  CA  COPYRIGHT 2002 ACS
AN   125:156455  CA
TI   Protective circuit for semiconductor integrated circuit
IN   Motai, Hiroshi
PA   Shinnippon Seitetsu Kk, Japan
SO   Jpn. Kokai Tokkyo Koho, 4 pp.
PI   JP 08172166       A2   19960702       JP 1994-333908   19941216
AB   The protective circuit consists of an input electrode, an output electrode,
     an amorphous Si well, and a Schottky barrier protective diode.  The
     protective circuit may have an amorphous Si protective resistor.

L14  ANSWER 27 OF 90  CA  COPYRIGHT 2002 ACS
AN   123:271647  CA
TI   Surface conductance measurements of adsorbed gases
AU   Bargeron, C. B.; Phillips, T. E.; Benson, R. C.
CS   Applied Physics Laboratory, Johns Hopkins University, Laurel, MD, 20723,
     USA
SO   Proceedings - Electronic Components & Technology Conference (1994), 44th,
     728-32
AB   The surface conductance of adsorbed water, carbon dioxide, and ammonia has
     been measured as a function of temp. using a triple-track test substrate.
     The individual pure gases were studied along with their mixts. Adsorbed
     carbon dioxide or ammonia was found to have a negligible surface
     conductance, while adsorbed water exhibited an increase in conductance
     beginning at -25°C.  Mixts. of carbon dioxide and water exhibited
     essentially the same conductance as water by itself, while mixts. of
     ammonia and water exhibited a conductance 104 times larger than water
     between -40°C and 0°C.  Mixts. of all three gases resulted in a relatively
     low conductance at lower temps. (-100°C to -50°C).  Corresponding pressure
     measurements indicated that vaporization was greatly suppressed in some
     cases, suggesting strong interaction between the adsorbed species.

L14  ANSWER 30 OF 90  CA  COPYRIGHT 2002 ACS
AN   121:242763  CA
TI   Integration of materials and processes for reliable silicon
     interconnections
AU   Paraszczak, J.
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CS IBM Semiconductor Research and Development Center, Yorktown Heights, NY, 10598, USA
SO J. Vac. Sci. Technol., B (1994), 12(4), 2835-8
AB As device densities in integrated circuits have grown, the no. of connections between them has followed, resulting in larger chips with increased nos. of layers of metal wiring. Traditionally, these layers of wiring have been fabricated using aluminum and its alloys for the **conductor** and **silicon** oxide as the dielec. and insulator. New combinations of dielecs. and metals promise improved performance and increased reliability, which can require alternative methods of fabrication.

L14 ANSWER 40 OF 90 CA COPYRIGHT 2002 ACS
AN 116:245772 CA
TI Surface conductance on insulators in the presence of water vapor
AU **Comizzoli, R. B.**
CS AT and T Bell Lab., Murray Hill, NJ, USA
SO Mater. Dev. Microelectron. Packag.: Perform. Reliab., Proc. Electron. Mater. Process. Congr., 4th (**1991**), 311-16. Editor(s): Singh, Prabjit. Publisher: ASM Int., Materials Park, Ohio.
AB The surface conductance of an insulator in the presence of water vapor is directly related to several failure mechanisms affecting electronic components and assemblies. These mechanisms include errors resulting from leakage current, corrosion, elec. arcing, and surface ion effects. Various investigators have presented data on the surface conductance of insulators. In general, the surface conductance depends exponentially on relative humidity. In this report a phenomenol. model that fits the empirical dependence of surface conductance on relative humidity and temp. is described.

L14 ANSWER 41 OF 90 CA COPYRIGHT 2002 ACS
AN 116:203246 CA
TI Anodic oxides on silicon
AU **Lewerenz, H. J.**
CS Bereich Photochem. Energieumwandlung, Hahn-Meitner-Inst. Berlin, Berlin, 1000/39, Germany
SO **Electrochim**. Acta (**1992**), 37(5), 847-64
AB The formation of anodic oxides on n- and p-type silicon was investigated by chronoamperometry, in situ ellipsometry, in situ excess microwave reflectivity measurements, ex situ x-ray and UPS (XPS and UPS) and LEED. Comparison with data on thermally oxidized samples reveals that anodic oxides are less dense being characterized by a compn. profile. In addn. differences in the etching rate and compn. profile of anodic oxides on n-Si and p-Si are obsd. The microwave measurements allow a correlation between oxide formation in NH4F soln. and changes in charge transfer velocity and surface recombination velocity. At high anodic potentials, photocurrent oscillations on oxidized samples occur at oxide coverages of about 35-40 Å as evidenced by XPS. The surface conditions during dark current flow are investigated by XPS, UPS and LEED. The dark current is assocd. with distinct surface changes resulting in an electrolytically hydrogenated surface if samples are emersed after dark current decay. Photocurrent multiplication processes are briefly described, studied by intensity modulated photocurrent spectroscopy (IMPS).

L14 ANSWER 47 OF 90 CA COPYRIGHT 2002 ACS
AN 114:33671 CA
TI The effect of volume resistivity on polymer electrical leakage current measurements
AU Troyk, Philip R.; Anderson, James E.

CS Illinois Inst. Technol., Chicago, IL, 60616, USA
SO Int. SAMPE Electron. Conf. (1989), 3(Electron. Mater. Processes), 969-82
AB The authors investigate the theor. prediction of elec. leakage currents for temp.-humidity-bias (THB) tests. An electrostatic finite element model was developed for **triple-track** and comb patterns. Using known values for vol. resistivity combined with a specific test pattern geometry, a prediction of leakage currents can be made. The model can be used to compute the leakage current for samples in which polymer-substrate interfacial currents are negligible thus predicting leakage currents for samples which would be expected to pass THB testing.

L14 ANSWER 53 OF 90 CA COPYRIGHT 2002 ACS
AN 111:88284 CA
TI Humidity-temperature-voltage acceleration model for corrosion of thin film aluminum
AU Osenbach, J. W.; Zell, J. L.
CS AT and T Bell Lab., Reading, PA, 19612-3566, USA
SO Proc. - Electrochem. Soc. (1989), 89-6(Proc. Symp. Reliab. Semicond. Devices Interconnect. Multilevel Met., Interconnect, Contact Technol., 1988), 53-80
AB The corrosion behavior of thin film Al metalization was studied as a function of temp., humidity, and bias (THB). The studies were done on (room-temp.-vulcanized silicone rubber)-coated unpassivated Al **triple-track** test structures. Studies were done at 85-150°, relative humidities between 50 and 85%, and elec. fields between 5 × 103 and 2 × 105 V/cm. Based on the results, the authors developed two acceleration models. The first model describes those failures that are caused by contaminants such as Na+, K+, and Cl-. This model can be used to predict the THB behavior of devices that are contaminated prior to encapsulation or are encapsulated in contaminated polymers such as epoxies. The second model describes those failure that occur due to wearout of the polymer-device interface. This model can be used to predict the THB behavior of devices that are "clean" and encapsulated in clean well-bonded polymers such as RTV.

L14 ANSWER 70 OF 90 CA COPYRIGHT 2002 ACS
AN 99:150388 CA
TI Evaluation of an encapsulant material for thick-film resistor networks appliqued to a thin film HIC
AU Iannuzzi, Melanie
CS Bell Lab., Inc., Allentown, PA, 18103, USA
SO Proc. - Electron. Compon. Conf. (1983), 33rd, 591-601
AB Modified Dow Corning 648 resin was evaluated for use as a peroxide-resistant, thermally stable, screenable encapsulant for hybrid integrated circuits (HIC). Temp.-humidity-bias (THB) testing of the encapsulant was carried out on **triple-track** test vehicles of several metalizations (thin-film TiPdAu conductors and Ta-N resistors, and thick-film PdAg, PtPdAg, PtAu and Au). The modified DC648 resin gave superlative THB performance, independent of exposure to peroxide or further encapsulation with silicone rubber. Temp. cycling resulted in surface crazing, which did not affect metalization reliability. The effect of the material and its cure cycle on serpentine trimmed thick-film resistors was negligible if a glaze was used under the encapsulant. Thermal aging and thermal cycling of the resistors resulted in acceptable behavior if the glaze was used. THB testing of a model of an appliqued structure resulted in outstanding performance of the encapsulant material on the thick-film resistor network. No adverse effects of the material were found on the thin-film components. Both of these results are independent of the use of peroxide on the samples.

L14 ANSWER 81 OF 90 CA COPYRIGHT 2002 ACS
AN 90:96426 CA
TI New acceleration factors for temperature, humidity, bias testing
AU Sbar, N. L.; Kozakiewicz, R. P.
CS Bell Teleph. Lab., Inc., Allentown, Pa., USA
SO Annu. Proc., Reliab. Phys. [Symp.] (1978), 16, 161-78
AB Device acceleration factors were estd. from data on the effect of temp., relative humidity, and bias potential on the surface conduction, using metalization test vehicles including **triple track** conductors on 99.5% alumina substrates and beam leaded Si chips fabricated with fine line conductor patterns. Anal. expressions for the acceleration factors were derived for both encapsulated and unencapsulated test specimens. Lower acceleration factors are predicted for specimens encapsulated with RTV silicone rubber than for unencapsulated specimens.

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